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# ECO-FRIENDLY DIALYSIS WITH THE SYSTEMIC DESIGN METHODOLOGY: AN ECO-FRIENDLY DIALYSIS MAY START FOR “THE GRAVE”

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## Introduction and Aims:

Dialysis produces about 600,000 tons of plastic wastes per year. The Systemic Design is one of the most innovative method to analyse the environmental impact of hardware and supplies production, from “Cradle-to-grave”. In medicine, attention to the environmental impact is still limited.

## Methods:

The pathway of the dialysis disposables was followed since their arrival to the hospital, and potential interventions were identified by a small working group made of nephrologists, trainees, students and nurses, starting from the analysis of the wastes (the grave).

## Results:

Each hemodialysis session produced 1.5-2 kg of plastic wastes (cost of disposal: 2.2-3 Euros per session, about 10% of the cost of the dialysis supplies); the cost for packaging discharge is not included. 1. External packaging: large amount of boxes (non-recycled cardboard), wrapped in plastic. Suggestion: non-disposable plastic coverage, reusable, for delivery. Cardboard boxes should be reused and reusable; the reuse of the same cardboard boxes for dialysis supplies should be considered. 2. Each box contains at least 2 A4 pages of “instructions”. Suggestions: use of recycled, non acid paper and ink; supply a reference site for instructions. 3. Packaging. There are two main philosophies of packaging: each element individually and “pre-assembled” packaging, in which a plastic “guide” helps mounting the dialysis machine. The latter are conceptually based upon the principle that time is more costly than wastes. Suggestion: consider compact packaging of single elements. 4. Dialysis companies supply pre-assembled “kits” for start and end of the dialysis sessions, which (suggestion) could be at least partly substituted with recycled/recyclable or reusable materials. 5. For disposables contaminated by blood, consider optimal geometry of waste bins: even where wastes are disposed by weight, the volume is crucial in determining transportation fees from hospitals to incinerators. 6. Reuse of dialysis filters for a limited time should be weighted against risks of infection, of loss of efficiency and of contamination by disinfectants.

## Conclusions:

The Systemic Design method may be a useful tool for defining single steps of “production” of a dialysis session, suggesting potential strategies. The approach “cradle to cradle” may be a starting point for a critical analysis, opening to further, more innovative steps, such as the “output>input” approach, learning from nature how to create and renovate “systems”.